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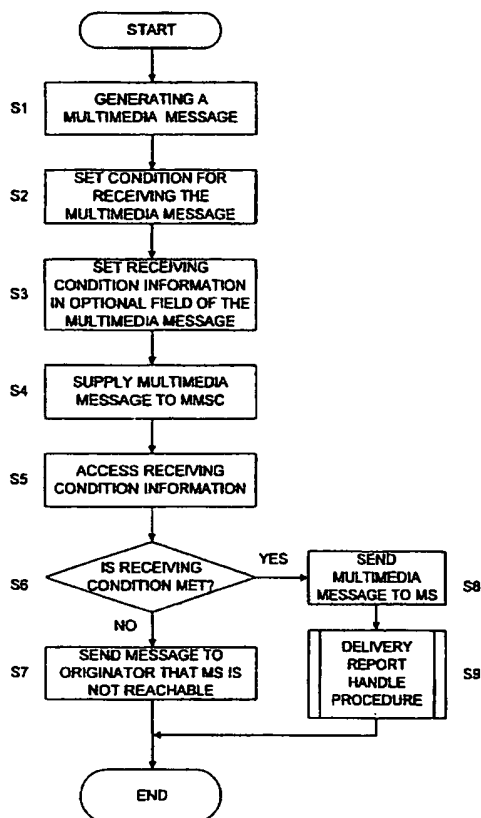
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(54) Title: LOCATION SENSITIVE MULTIMEDIA MESSAGING (MMS)



(57) Abstract: The invention proposes a method for delivering messages in a network comprising at least one terminal device, comprising the steps of generating a message (S1), setting a condition for receiving the message (S2, S3), deciding whether the message is to be received by the terminal device on the basis of the condition (S5, S6), and transmitting the message to the terminal device on the basis of the result of the deciding step (S8). By this method, messages are only transmitted to a terminal device if certain condition, e.g., location conditions, are met. The invention also proposes a network system and a message generating device, a message delivering device and a terminal device adapted to the above method.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

LOCATION SENSITIVE MULTIMEDIA MESSAGING (MMS)Field of the invention

- 5 The present invention relates to a method a network system for delivering messages in a network comprising at least one terminal device.

10 BACKGROUND OF THE INVENTION

- The invention relates to delivering of messages and in particular to delivering of multimedia messages which are delivered by the so-called Multimedia Messaging Service
- 15 (MMS). A Multimedia Message (MM) can contain all kind of messages, like pictures, video clips, sounds, speech etc., or any arbitrary combination of these.

- From a technical viewpoint, the MMS provides a non-
- 20 realtime service which operates partly in a store-and-forward fashion. Multimedia messages are transmitted using an air interface (for example, a GPRS air interface, any Wireless LAN, UMTS etc.).

- 25 The multimedia messages can be sent from an identified user/application of a network (e.g., intranet) to a mobile station (MS), from the MS to the network (intranet or internet) or from the MS to another MS.

- 30 Furthermore, a network element providing important functions for the MMS is the so-called Multimedia Messaging Service Centre (MMSC). The MMSC contains a store-and-forward function which stores the multimedia messages in a database and tries to send them to the

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recipient mobile station (MS). For this, the MMSC is informed automatically when the MS has become reachable.

5 Multimedia messages usually have a validity period. The messages are removed from the database of the MMSC in which they are stored if they cannot be delivered to the MS during the validity period.

Regarding the delivery of the messages, the mobile  
10 terminated multimedia messages have two delivery options: The multimedia message is sent automatically to the recipient MS, or the recipient is informed of the arrived multimedia message using SMS, for example. The notification contains at least the message size and the  
15 message identification. Then, the user can explicitly request the network to the multimedia message to the MS. The choice between the delivery options can based on the message size or the message content type. For example, it can be set that messages less than 1000 kB are delivered  
20 automatically to the MS, or that text and voice messages are delivered automatically to the MS.

When sending messages, it is often not always useful to transmit a message to a recipient MS. For example, in  
25 case such a message contains tourist information concerning a particular town, it is not useful to send this message to a user, who has left this town.

This is in particular a problem in case the message is a  
30 multimedia message which is in general considerably large. Thus, if such a message is transmitted although it is not required, the corresponding network is affected to an undesirable heavy load.

SUMMARY OF THE INVENTION

Therefore, the object underlying the invention resides in removing the above drawbacks of the prior art.

5

This object is solved by a method according to claim 1. In particular, according to the invention, a method for delivering messages in a network comprising at least one terminal device is provided. The method comprises the  
10 steps of generating a message, setting a condition for receiving the message, deciding whether the message is to be received by a terminal device on the basis of the condition, and transmitting the message to the terminal device on the basis of the result of the deciding step.

15

Alternatively, the above object is solved by a network system for delivering messages in a network as defined in claim 12. The network system comprises a message  
delivering device, and a terminal device. The message  
20 delivering device comprises a deciding means adapted to decide whether a message is to be received by the terminal device on the basis of a condition for receiving the message. Furthermore, the message delivering device comprises a transmitting means adapted to transmit the  
25 message on the basis of the deciding result of the deciding means to the terminal device.

Thus, by the method and the system according to the invention, a condition can be set for delivering a  
30 message to a terminal. That is, if this condition is not met, the message is not delivered. By this measure, the load on the network is reduced since no messages are transmitted which are not required.

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- In addition, the invention proposes a report delivery condition setting device according to claim 24 for setting a condition for receiving a delivery report. The report delivery condition setting device comprises a
- 5 setting means for setting a condition for receiving the message by a terminal device, and a supplying means for supplying the message including the condition to a message delivering device.
- 10 Moreover, the invention proposes a message delivering device for delivering a message in a network according to claim 29, wherein for the message a condition for receiving the message by a terminal device is set. The message delivering device comprises a deciding means
- 15 adapted to decide whether the message is to be received by the terminal device on the basis of the condition, and a transmitting means adapted to transmit the message to the terminal device on the basis of the deciding result of the deciding means.
- 20 Furthermore, the invention proposes a terminal device for receiving a message for which a condition for receiving the message is set for use in network according to claim 35. The terminal device comprises a receiving means for
- 25 receiving the message, a judging means for judging whether a delivery report is to be transmitted or not in response to receiving the message, and a transmitting means for transmitting the delivery report in case the judging means judges that the delivery report is to be
- 30 transmitted.

Further advantageous developments are set out in the dependent claims.

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In particular, the condition which is set for receiving or not receiving a message can be the location of the terminal, for example. That is, delivering of the message can be made dependent on whether the terminal, i.e., the user, is in a particular area. This is useful for transmitting advertisements, tourist information regarding a specific area or the like.

The location can be detected, for example, by accessing a Mobile Location Centre (MLC) for obtaining the latest position of the terminal. The location could also be available, for example at the home location register (HLR) or visitor location register (VLR). By this measure, the latest position can easily be obtained by referring to network elements already implemented in the network.

Also other conditions for receiving the message are possible. For example, an originator of the messages can be listed in a database of the terminal device, i.e., the mobile station. Hence, if a user of a terminal device is always interested to receive messages from a particular originator, this originator can be included in such a database. Then, receiving of the message can easily be permitted.

Moreover, the originator can belong to a group which is defined on the network side. Thus, if the user of the terminal device is always interested to receive messages from this originator group, this group can be listed in the database.

Furthermore, the recipient of the messages can be in a specific state with respect to willingness to receive messages in general or messages of given type or

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category. The state of the recipient may be enquired by the deciding means. The category condition of the message may have been set at the originator side automatically by the network, e.g., in order to prevent advertisement type  
5 of messaging without permission.

The information regarding the condition for receiving a message can be included in an optional field of the message. Hence, the information necessary to judge  
10 whether the deciding step is required can easily be detected within the message.

Furthermore, the terminal device can be determined as being inactive or busy in case it is decided that the  
15 condition is not met. By this measure, such a terminal device can be handled in the same way as if the terminal is not available in the moment. That is, no special procedure for handling messages which do not meet the condition is required. Furthermore, it can be decided  
20 whether delivering of the message should be tried later again or whether the message should not be delivered at all, as it is possible for a normal communication (e.g., phone call or fax transmission).

25 A delivery report can be sent to the originator of the message, i.e., the user of the multimedia message generator 1. However, it can be arranged that the delivery report can only be sent if the originator of the message is permitted to receive the delivery report. By  
30 this measure, it is taken care of the privacy of a user. That is, by this measure the user can avoid that someone is able to track his location without his consent.

The originators which are permitted to receive delivery  
35 reports from the particular terminal can be stored in a



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list in a database. Thus, the user does not have to decide for each reception of a message whether a delivery report should be transmitted or not.

5 Alternatively, a group of users can be defined which may receive delivery reports. That is, if the decision as to whether an originator is permitted to receive delivery reports, a detection whether the originator is a member of the group is sufficient. This measure simplifies the  
10 decision.

Furthermore, in order to identify an originator as a member of such a group of users, a group identifier can be added or attached to the message. Hence, an easy  
15 detection is possible.

The message can be a multimedia message. In this case, the above advantages are considerably important since multimedia messages are usually large. Therefore, the  
20 load on the network due to messages not required can be reduced considerably.

Furthermore, the network can be a mobile network and the terminal device can be a mobile station. Especially in  
25 case of a mobile network, the invention is advantageously since a mobile network usually has only limited capacities for transmitting large messages.

### 30 BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more readily understood with reference to the accompanying drawings in which:

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Fig. 1 shows a structure of a network system according to an embodiment,

Fig. 2 shows a flow chart of a procedure for delivering multimedia messages according to the embodiment of the invention, and

Fig. 3 shows a flow chart of a procedure for handling a delivery report according to the embodiment.

10

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

In the following, a preferred embodiment of the invention is described in more detail with reference to the accompanying drawings.

Fig. 1 shows a general structure of a network system according to the embodiment. According to this embodiment, multimedia messages are delivered via a mobile network. The network system comprises a multimedia message generator 1, a Multimedia Messaging Services Centre MMSC 2 as an example for a message delivering device, a mobile network 3 and a mobile station MS 4 as an example for a terminal device, which is adapted to receive and reproduce multimedia messages.

It is to be noted that for simplifying the description and the drawings only the network elements are shown which are important for the invention. Thus, network elements like base stations BS, base station controllers BSC, Mobile Services Switching Centres MSC and the like are omitted.

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In the following, the individual network elements mentioned above and their functions are described in more detail with reference to Fig. 1.

5 The multimedia message generator 1 is a device by which a multimedia message is generated and transmitted to the mobile network. By this network element, a user can generate a multimedia message. The multimedia message generator 1 can be a mobile station which is adapted to  
10 generate such multimedia messages, for example. According to this embodiment, however, it is assumed that the multimedia message generator 1 is fixed and connected to the MMSC 2 via a fixed network.

15 The multimedia message generator 1 can be realised by a computer including a modem (wherein the multimedia messages are sent to the MMSC via the Internet or Intranet), or by a specially designed terminal or the like.

20

The specific feature of the multimedia message generator 1 according to the present invention is that the user can set a condition for receiving the multimedia message by the MS 4. According to this embodiment, the condition is  
25 the location of the MS 4. That is, the message should only be transmitted to the MS 4 in case the MS 4 is located in a certain area. For example, the location condition can be that the MS 4 is located in a particular town or is located in its Home Public Land Mobile Network  
30 (HPLMN), home country, in Europe or the like.

The multimedia message generator 1 comprises a condition setting means 11 by which a condition regarding the message can be set. According to this embodiment, the condition setting means 11 sets the information regarding  
35 the location condition in an optional field of the

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multimedia message. The multimedia message containing the information regarding the location is transmitted by a message transmitter 12 to the MMSC 2.

- 5 The MMSC 2 is a network element necessary for delivering of multimedia messages, as already described in the introductory part. According to this embodiment, the MMSC is expanded by functions for delivering the messages in which a condition for receiving can be set. For  
10 simplifying the description, only these additional means are described and shown in Fig. 1.

The MMSC 2 comprises a multimedia message delivery deciding means 21 which investigates the multimedia  
15 message received from the multimedia message generator 1. This is effected by checking the optional field of the multimedia message. That is, the multimedia message delivery deciding means 21 extracts the location condition information. The multimedia message delivery  
20 deciding means 21 knows from the normal address block of the multimedia message to which mobile station the multimedia message is to be transmitted.

Thus, the current location of the mobile station MS 4 has  
25 to be detected. According to this embodiment, the deciding means 21, i.e., the MMSC, accesses a Mobile Location Centre MLC 5 which provides the required location information regarding the MS 4. It is to be noted that this network element or a similar element is  
30 usually provided in all mobile networks.

Thus, the multimedia message delivery deciding means 21 decides based on the location condition for the message and the location information received from the MLC 5

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whether the condition is fulfilled, i.e., whether the MS 4 is located in the requested area or not.

In case the condition is not met, a failure returning  
5 means 22 of the MMSC 2 sends a message back to the multimedia generator 1. In particular, this message is the same message as if the MS 4 would be not available. Hence, for the message generator 1, the MS 4 is considered as not being reachable.

10

In case the condition is met, the multimedia message is transmitted to the MS 4 via the mobile network 3 by a message transmitter 23.

15 The multimedia message is received by a multimedia message receiver 41 of the MS 4. The multimedia message is then reproduced by using a message reproducing means 42 which can be a combination of a display and a loudspeaker, for example.

20

Furthermore, the MS 4 comprises a delivery report handler 43. This handler 43 serves to judge whether a delivery report should be transmitted or not. Namely, the user of the generator 1 can select that a delivery report should  
25 be transmitted back to him in response to reception of the multimedia message by the MS 4. However, by this measure the location of a user of the MS 4 could be traced. The user might not wish that the message originator can get aware of his location, and by  
30 providing the handler 43 sending of undesired delivery reports can be avoided.

According to this embodiment, the delivery report handler 43 accesses an originator database 44 in which the user  
35 of the MS 4 has stored a list of originators which may

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receive delivery reports. As an alternative, such a list of originators can also be stored on the network, i.e., in a suitable network element, e.g., the MMSC.

Furthermore, a group of users which are permitted to  
5 receive delivery reports can be defined. In this case, a group identifier can be added or attached to the message such that the delivery report handler 43 has only to check whether a group identifier is present in the message (e.g., in a corresponding optional field) and  
10 whether members of this group are permitted to receive delivery reports. Group identifiers can also be stored in the database 44.

In case the originator of the current multimedia message  
15 is permitted to receive delivery reports, the delivery report is transmitted by a delivery report transmitter 45 via the mobile network 3 to the message generator 1.

The method according to this embodiment is summarised by  
20 referring to the flow charts shown in Figs. 2 and 3.

Steps S1 and S4 are carried out by the message generator. That is, a message is generated (step S1). Then, the condition for receiving the multimedia message is set  
25 (step S2). In the present embodiment, the condition is a location condition. The receiving condition information is set in an optional field of the multimedia message (step S3) and the multimedia message is supplied to the MMSC 2 (step S4).

30

The MMSC 2 accesses the receiving condition information of the multimedia message (step S5) and decides whether the receiving condition is met or not (step S6). In case the receiving condition is not met (NO in step S6), a  
35 message that the MS 4 is inactive or busy is sent to the

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multimedia message generator 1. In case the receiving condition is met (YES in step S8), the multimedia message is actually transmitted via the mobile network 3 to the MS 4.

5

In the MS 4, the multimedia message is reproduced. In response to receiving the multimedia message, a delivery report handle procedure is carried out (step S9) which is described with reference to the flowchart shown in Fig.

10 3. This procedure is carried out by the delivery report handler 43.

First, in step S91 it is determined whether a delivery report is requested for the current multimedia message.

15 In case no delivery report is requested (NO in step S91), the procedure is immediately ended. In case a delivery report is requested (YES in step S91), the originator database 44 is accessed (step S92). Then, it is determined whether the originator of the current  
20 multimedia message is permitted to receive delivery reports in step S93. That is, if the originator of the present multimedia message could not be found in the database 44, it is determined that the present originator is not allowed to receive delivery reports (NO in step  
25 S93), and the procedure is ended without transmitting a delivery report.

On the other hand, if the present originator could be found in the database 44, it is determined that the  
30 present originator may receive delivery reports (YES in step S93), and a delivery report is transmitted to the originator (step S94).

According to a modification of the embodiment, the MS 4  
35 does not comprise an originator database 44. Instead, the

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delivery report handler 43 comprises an operation panel (not shown) by which the user of the MS 4 can input whether he wishes transmitting of the delivery report of the current multimedia message or not. By this measure, the user has to decide regarding the delivery report for every multimedia message. However, this measure has the advantage that the structure of the MS 4 can be simplified and its costs can be reduced since no database is required.

10

The above description and accompanying drawings only illustrate the present invention by way of example. Thus, the embodiment of the invention and the modification thereof may vary within the scope of the attached claims. For example, the embodiment and the modification thereof can be combined. That is, in case the originator of the current multimedia message could not be found in the database 44, the MS 4 can be arranged such that the user has to input whether he wishes to transmit the delivery report nevertheless. Furthermore, the user can be asked whether he wishes to store such a new originator in the database 44.

As a further alternative, a default value can be provided in the MS. Such a default value is used for delivery report sending and can indicate, always send/always confirm/never send for example. Thus, the user of the MS has a further possibility to control sending of the delivery report in an easy manner.

30

Moreover, according to the above described embodiment, the message delivering device is included in the MMSC which is a general control element for MMS (Multimedia Messaging Services). However, this device can also be a



separate network element or can be included in other network elements, when appropriate.

5 In addition, the multimedia message generator can also be a part of a mobile station and the connection between the message generator and the MMSC (multimedia message delivering device) can be provided by the mobile network. Also, the terminal device 4 is not limited to a mobile station, this could be also a fixed station.

10 Moreover, according to the above described embodiment, the condition setting means 11 has been described as a part of the multimedia message generator 1. However, the condition setting means can also be an independent  
15 network element. For example, the messages can be generated in a another network under a different administration, whereas the condition is set in the present network, for example in a proxy server or the like.

20 Finally, the condition described above is not limited to the location condition. For example, also certain information regarding the user of the addressed terminal can be used to set conditions. In this case, the  
25 multimedia message delivery deciding means 21 has to be correspondingly modified such that it can access to corresponding databases, for example to the HLR or VLR or more sophisticated databases.

30 Alternatively, it can be arranged that a user can decide whether he desires to receive a message or not in advance. For example, an originator of the messages can be listed in a database of the terminal device, i.e., the mobile station. Hence, if a user of a terminal device is  
35 always interested to receive messages from a particular

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originator, this originator can be included in such a database. Then, receiving of the message can easily be permitted. Such originators can also be included in a group of originators. Thus, this group can be included in  
5 the database.

Furthermore, the recipient of the messages can be in a specific state with respect to willingness to receive messages in general or messages of given type or  
10 category. The state of the recipient may be enquired by the deciding means. The category condition of the message may have been set at the originator side automatically by the network, e.g., in order to prevent advertisement type of messaging without permission.

15

**Claims**

1. A method for delivering messages in a network (3)  
5 comprising at least one terminal device, comprising the steps of  
generating (S1) a message,  
setting (S2, S3) a condition for receiving said message,  
10 deciding (S5, S6) whether said message is to be received by a terminal device (1) on the basis of said condition, and  
transmitting (S8) said message to said terminal device (1) on the basis of the result of the deciding  
15 step.
2. The method according to claim 1, wherein said setting step (S2, S3) is performed by a terminal device (4).
- 20 3. The method according to claim 1, wherein said condition is the location of said terminal device (1).
4. The method according to claim 1, further comprising  
25 the step of  
including (S3) information regarding said condition in an optional field of said message.
5. The method according to claim 1, further comprising  
30 the step of  
determining (S7) said terminal device (1) as being inactive or busy in case it is decided that said condition is not met.

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6. The method according to claim 1, further comprising the step of

deciding (S22, S23) whether the originator of said message is permitted to receive a delivery report, and

5 transmitting (S24) said delivery report to the originator of said message only in case said originator of said message is permitted.

7. The method according to claim 6, further comprising  
10 the step of

storing a list of originators of messages in a database (44) which are permitted to receive delivery reports.

15 8. The method according to claim 6, further comprising the step of

defining a group of users which are allowed to receive delivery reports, wherein

20 in said deciding step it is detected whether the originator of said received message is a member of said group of users.

9. The method according to claim 8, further comprising the step of

25 adding a group identifier identifying said group of users to said message.

10. The method according to claim 1, wherein said message is a multimedia message.

30

11. The method according to claim 1, wherein said network (3) is a mobile network and said terminal device (4) is a mobile terminal device.

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12. A network system for delivering messages in a network (3), comprising

a message delivering device (2); and

a terminal device (4); wherein

5       said message delivering device (2) comprises a deciding means (21) adapted to decide whether said message is to be received by said terminal device (4) on the basis of a condition for receiving said message, and a transmitting means (23) adapted to transmit said  
10       message on the basis of the deciding result of said deciding means (21) to said terminal device (4).

13. The system according to claim 12, further comprising a message generating device (1), wherein said

15       message generating (1).

14. The system according to claim 12, further comprising a setting means (11) for setting a condition for receiving a message by said terminal device (4).

20

15. The system according to claim 12, wherein said condition is the location of said terminal device (4).

16. The system according to claim 12, wherein said  
25       message comprises an optional field in which information regarding said condition is included.

17. The system according to claim 12, wherein said message delivering device (2) further comprises a  
30       determining means (23) adapted to determine said terminal device (4) as not being reachable in case said deciding means (21) decides that said condition is not met.

18. The system according to claim 12, wherein said  
35       terminal device further comprises

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a judging means (43) for judging whether a delivery report is to be transmitted or not in response to receiving said message; and

5 a transmitting means (45) for transmitting said delivery report in case said judging means (43) judges that said delivery report is to be transmitted.

19. The system according to claim 17, wherein said terminal device further comprises a database (44) in  
10 which a list of originators of messages is stored which are permitted to receive delivery reports and which is accessed by said judging means (43).

20. The system according to claim 17, wherein a group of  
15 users are defined which are permitted to receive delivery reports, and

said judging means (43) is adapted to detect whether the originator of said received message is a member of said group of users.

20

21. The system according to claim 19, wherein said group identifier identifying said group of users is added to said message.

25 22. The system according to claim 12, wherein said message is a multimedia message.

23. The system according to claim 12, wherein said network (3) is a mobile network and said terminal device  
30 (4) is a mobile terminal device.

24. A report delivery condition setting device, comprising

a setting means (11) for setting a condition for  
35 receiving a message by a terminal device (4) , and

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a supplying means (12) for supplying said message including said condition to a message delivering device (2).

5 25. The report delivery condition setting device according to claim 24, wherein said condition is the location of said terminal device (4).

10 26. The report delivery condition setting device according to claim 24, wherein said message comprises an optional field in which information regarding said condition is included.

15 27. The report delivery condition setting device according to claim 24, wherein said message is a multimedia message.

20 28. The report delivery condition setting device according to claim 24, wherein said network (3) is a mobile network and said terminal device (4) is a mobile terminal device.

25 29. A message delivering device for delivering in a network (3) a message for which a condition for receiving said message by a terminal device (4) is set, comprising a deciding means (21) adapted to decide whether said message is to be received by said terminal device (4) on the basis of said condition, and

30 a transmitting means (23) adapted to transmit said message to said terminal device (4) on the basis of the deciding result of said deciding means (21).

35 30. The message delivering device according to claim 29, wherein said condition is the location of said terminal device (4).

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31. The message delivering device according to claim 29, wherein said message comprises an optional field in which information regarding said condition is included.

5

32. The message delivering device according to claim 29, further comprising a determining means (22) adapted to determine said terminal device (4) as being inactive or busy in case said deciding means (21) decides that said  
10 condition is not met.

33. The message delivering device according to claim 29, wherein said message is a multimedia message.

15 34. The message delivering device according to claim 29, wherein said network (3) is a mobile network and said terminal device (4) is a mobile terminal device.

35. A terminal device for receiving a message for which  
20 a condition for receiving said message is set for use in network (3), comprising

a receiving means (41) for receiving said message;  
a judging means (42) for judging whether a delivery report is to be transmitted or not in response to  
25 receiving said message; and

a transmitting means (45) for transmitting said delivery report in case said judging means (42) judges that said delivery report is to be transmitted.

30 36. The terminal device according to claim 35, further comprising a database (44) in which a list of originators of messages is stored which are permitted to receive delivery reports and which is accessed by said judging means (42).

35



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37. The terminal device according to claim 36, wherein said condition is the location of said terminal device.

38. The terminal device according to claim 36, wherein  
5 said message is a multimedia message.

39. The terminal device according to claim 36, wherein said network (3) is a mobile network and said terminal device (4) is a mobile terminal device.

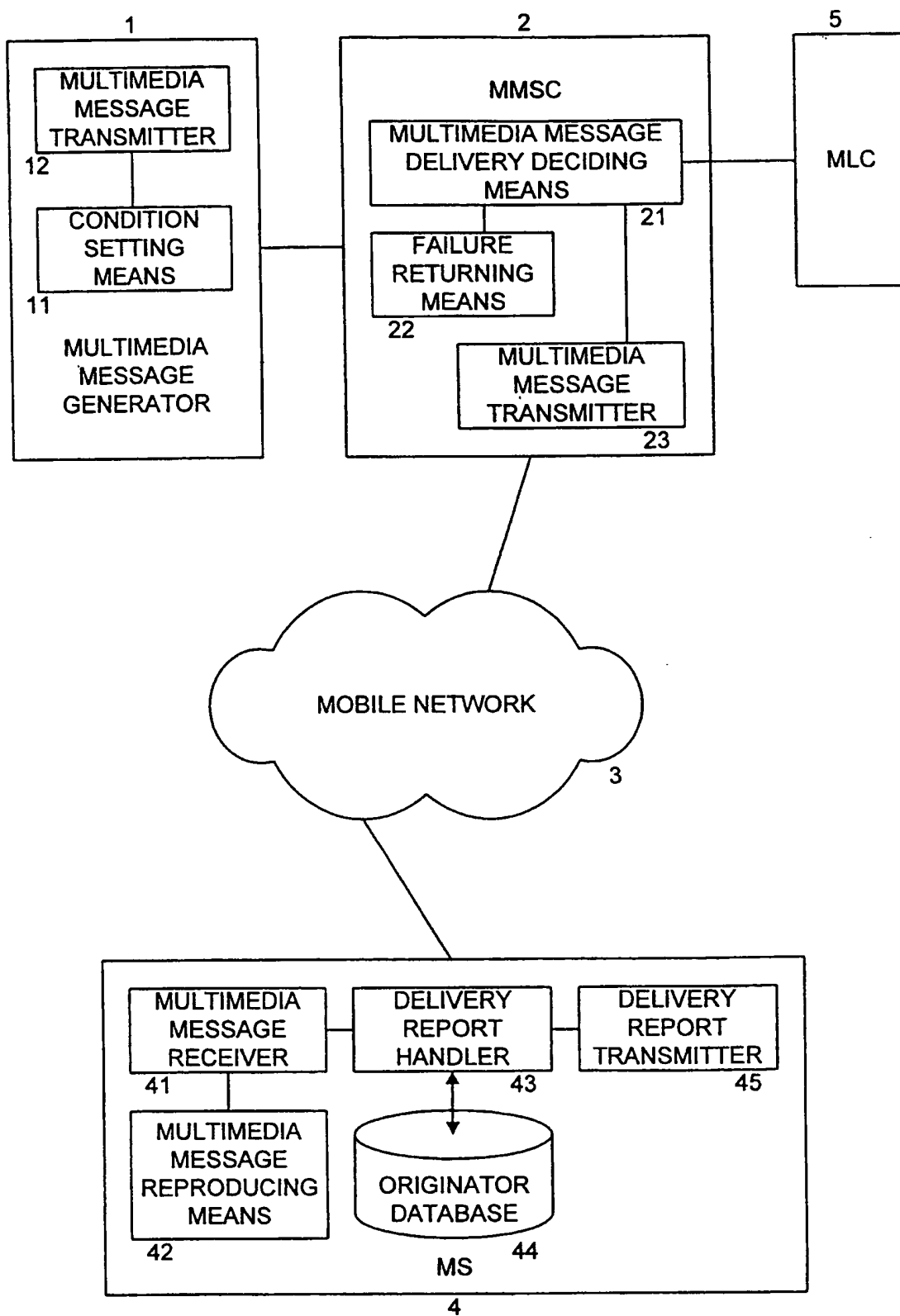
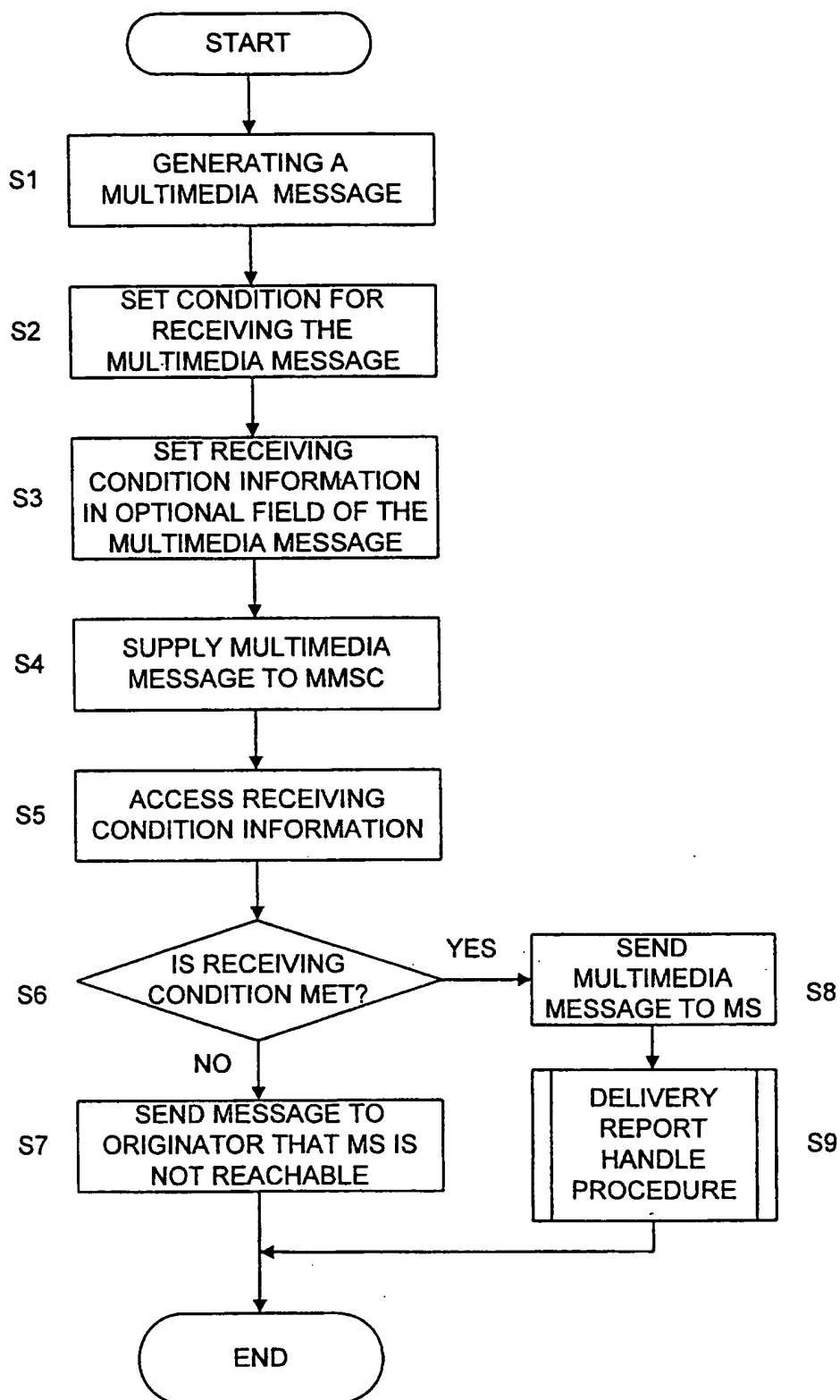
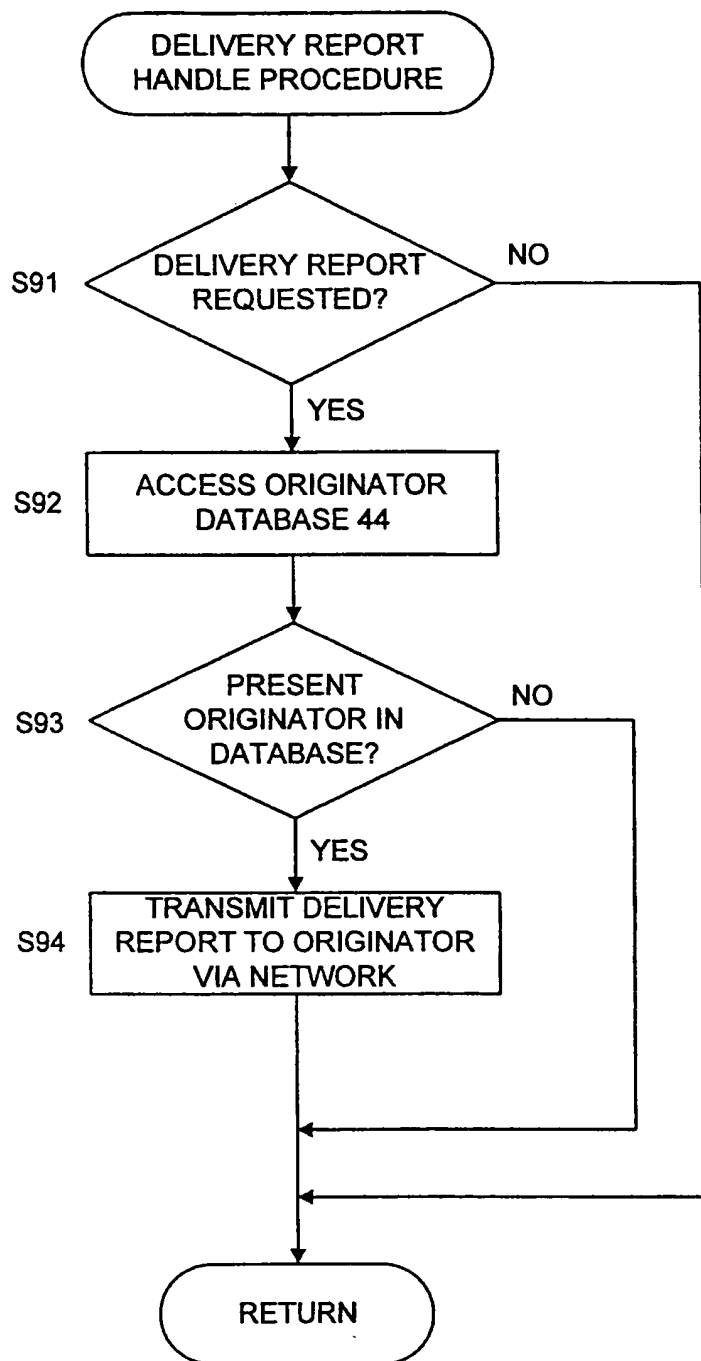


FIG. 1

**FIG. 2**

**FIG. 3**

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/07563

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L12/58

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 493 692 A (GOLDSTEIN RICHARD J ET AL) 20 February 1996 (1996-02-20)	1-5, 11-17, 23, 29-32,34
Y	abstract column 6, line 15 - line 22 column 7, line 61 -column 8, line 11 column 9, line 60 -column 10, line 38 column 14, line 49 - line 66 figures 2,3,5,6,9,17	6,10,18, 22, 25-27, 33,35
	— —/—	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search

20 June 2000

Date of mailing of the international search report

28/06/2000

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/07563

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 10558 A (BELL COMMUNICATIONS RES) 20 March 1997 (1997-03-20) abstract page 10, line 12 - line 25 page 11, line 18 - line 27 page 13, line 29 -page 14, line 13	1-3, 5, 11-15, 23
X	WO 97 28518 A (MOTOROLA INC) 7 August 1997 (1997-08-07) abstract page 30, line 32 -page 31, line 11 figure 19	24, 28
Y		6, 18, 25-27, 35
Y	EP 0 785 661 A (AT & T CORP) 23 July 1997 (1997-07-23) abstract column 2, line 47 -column 3, line 13	10, 22, 27, 33

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5493692	A	20-02-1996	NONE	
WO 9710558	A	20-03-1997	NONE	
WO 9728518	A	07-08-1997	AU 1701097 A BR 9708293 A CN 1219259 A EP 0877993 A	22-08-1997 03-08-1999 09-06-1999 18-11-1998
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